

**Montana Board of Oil and Gas Conservation  
Environmental Assessment**

**Operator:** Onshore Holdings LLC  
**Well Name/Number:** Hougen 32-1H  
**Location:** NW NW Section 32 T11N R30E  
**County:** Musselshell, MT; Field (or Wildcat) W/C

**Air Quality**

(possible concerns)

Long drilling time: No, 25 to 35 days drilling time.

Unusually deep drilling (high horsepower rig): No, a triple derrick drilling rig to drill a vertical pilot hole to 5000' TD, Otter Formation. Then if shows warrant to plug back and kickoff to drill a 10,753'MD/4547'TVD Heath Formation single lateral horizontal well test.

Possible H2S gas production: Slight H2S possible.

In/near Class I air quality area: No class I air quality area.

Air quality permit for flaring/venting (if productive) Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: \_\_\_\_\_

Comments: No special concerns – using triple drilling rig to drill a vertical pilot hole to 5000' TD, Otter Formation. Then if shows warrant to plug back and kickoff to drill a 10,753'MD/4547'TVD Heath Formation single lateral horizontal well test. If there are gas gathering systems in the area it is recommended that associated gas be gathered. If no gas gathering systems in the area, associated sweet gas and H2S gas can be flared under Board Rule 36.22.1220.

**Water Quality**

(possible concerns)

Salt/oil based mud: Yes, vertical pilot hole to 5676' and intermediate casing hole will be drilled with oil based invert drilling fluid (3393'-5000'). Horizontal lateral will be drilled with brine (5000'-10,753'). surface hole will be drilled with freshwater (0-3393'), rule 36.22.1001.

Surface drainage leads to live water: No, closest drainages are unnamed ephemeral tributary drainages to North Willow Creek, adjacent to the northwest corner of this location and about 1/8 of a mile to the southwest from this location.

Water well contamination: No water wells within 1 mile or further from this location. This well will set 9 5/8" surface casing to 3393' and cement to surface. Well will be drill with oil based invert drilling fluids from base of surface casing to about 5,000 TVD pilot hole, into the Otter formation. Well will be evaluated. If shows warrant pilot hole will be plugged back and kicked off and drilled horizontally into the Heath Formation to 10,753'MD/4547'TVD well test.

Porous/permeable soils: No, silty "gumbo" clay soils.

Class I stream drainage: No Class I stream drainages.

Mitigation:

☐ Lined reserve pit

- ☒ Adequate surface casing  
☐ Berms/dykes, re-routed drainage  
☒ Closed mud system  
☒ **Off-site disposal of liquids (in approved facility)**  
☒ Other: Lined cuttings pit will be utilized with a impervious synthetic liner of a minimum 12 mil thickness.

Comments: Freshwater mud system to be used on surface hole. Freshwater mud system to be used from surface to 3393', rule 36.22.1001. Pilot hole will be drilled with oil based invert drilling fluids (3393'-5000'). Intermediate casing hole will be drilled with oilbased invert drilling fluid (3974'-4874'). Horizontal lateral will be drilled with brine (4874'-10,753'). Oil based drilling fluids will be recycled. Brine fluids will be disposed of at a commercial SWD disposal. Freshwater drilling fluids can be evaporated or disposed of a commercial SWD disposal. Freshwater drilled cuttings, oil base cuttings and brine cuttings will be allowed to dry in the lined cuttings pit, prior to pit closure. Pit solids will be left in the lined pit and backfilled with at least 4' of cover when dry. No concerns.

### Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No live water stream crossings. Crossing only ephemeral drainages.

High erosion potential: No, small cut, up to 8.8' and small fill, up to 4.6', required.

Loss of soil productivity: No, location will be restored after drilling, if nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: No, a large location, 300'X350' size required.

Damage to improvements: Slight, surface use is grazing land.

Conflict with existing land use/values: Slight

Mitigation

- ☐ Avoid improvements (topographic tolerance)  
☐ Exception location requested  
☒ Stockpile topsoil  
☐ Stream Crossing Permit (other agency review)  
☒ Reclaim unused part of wellsite if productive  
☐ Special construction methods to enhance reclamation  
☐ Other: \_\_\_\_\_

Comments: Access will be from existing county road, Ragged Point Road and existing lease road. The access road will be built from existing lease road into location, about 4538'. Well cuttings (freshwater, oilbase and brine) will buried in the lined cuttings pit. Lined cuttings pit will backfilled with 4' of cover when dry. No concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: No residences within 1 mile radius in any direction from this location.

Possibility of H2S: Yes, possible.

Size of rig/length of drilling time: Triple derrick drilling rig, about 25 to 35 days drilling time.

Mitigation:

- ☒ Proper BOP equipment  
☐ Topographic sound barriers  
☐ H2S contingency and/or evacuation plan

\_\_\_ Special equipment/procedures requirements

\_\_\_ Other: \_\_\_\_\_

Comments: Operational BOP (5,000 psig rated annular, double ram, flanges and choke manifold) and adequate surface casing should mitigate any problems, rule 36.22.1014. No concerns.

### **Wildlife/recreation**

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified.

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Threatened or endangered species identified is the Black Footed Ferret. Candidate species is the Greater Sage Grouse and Sprague's Pipit. Proposed species is the Mountain Plover. NH tracker website only lists five (5) species of concern: Black-tailed Prairie Dog, Greater Sage Grouse, Loggerhead Shrike, Sage Thrasher and Brewers Sparrow.

Mitigation:

\_\_\_ Avoidance (topographic tolerance/exception)

\_\_\_ Other agency review (DFWP, federal agencies, DSL)

\_\_\_ Screening/fencing of pits, drillsite

\_\_\_ Other: \_\_\_\_\_

Comments: Private surface grazing land. There may be species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

### **Historical/Cultural/Paleontological**

(possible concerns)

Proximity to known sites None identified.

Mitigation

\_\_\_ avoidance (topographic tolerance, location exception)

\_\_\_ other agency review (SHPO, DSL, federal agencies)

\_\_\_ Other: \_\_\_\_\_

Comments: Private surface grazing land. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

### **Social/Economic**

(possible concerns)

\_\_\_ Substantial effect on tax base

\_\_\_ Create demand for new governmental services

\_\_\_ Population increase or relocation

Comments: Well is a wildcat, until production is established no social or economic impact can be assessed.

### **Remarks or Special Concerns for this site**

Well is a wildcat vertical pilot hole test to 5000' TD, Otter Formation. Then if shows warrant to plug back and kickoff to drill a 10,753'MD/4547'TVD Heath Formation single lateral horizontal well test.

**Summary: Evaluation of Impacts and Cumulative effects**

No long term impacts expected. Some short term impacts will occur.

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I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Steven Sasaki  
(title:) Chief Field Inspector  
Date: June 22, 2013

Other Persons Contacted:

Montana Bureau of Mines and Geology GWIC website

(Name and Agency)  
Musselshell County water wells  
(subject discussed)  
June 22, 2013  
(date)

US Fish and Wildlife, Region 6 website  
(Name and Agency)  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES  
MONTANA COUNTIES, Musselshell County  
(subject discussed)  
June 22, 2013  
(date)

Montana Natural Heritage Program Website (FWP)  
(Name and Agency)  
Heritage State Rank= S1, S2, S3, T11N R30E  
(subject discussed)  
June 22, 2013  
(date)

Montana Cadastral Website  
(Name and Agency)  
Surface Ownership and surface use Section 32 T11N R30E  
(subject discussed)  
June 22, 2013  
(date)

If location was inspected before permit approval:

Inspection date: \_\_\_\_\_

Inspector: \_\_\_\_\_

Others present during inspection: \_\_\_\_\_